

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PU040062	FOR FURTHER ACTION	
	See Form PCT/IPEA/416	
International application No. PCT/US2004/007676	International filing date (<i>day/month/year</i>) 09.03.2004	Priority date (<i>day/month/year</i>) 09.03.2004
International Patent Classification (IPC) or national classification and IPC H04B1/707, H04L25/03		
Applicant THOMSON LICENSING S.A. et al.		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
a. <input type="checkbox"/> <i>(sent to the applicant and to the International Bureau)</i> a total of sheets, as follows:
<input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
<input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
b. <input type="checkbox"/> <i>(sent to the International Bureau only)</i> a total of (indicate type and number of electronic carrier(s)), containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:
<input checked="" type="checkbox"/> Box No. I Basis of the opinion
<input type="checkbox"/> Box No. II Priority
<input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/> Box No. IV Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/> Box No. VI Certain documents cited
<input type="checkbox"/> Box No. VII Certain defects in the international application
<input type="checkbox"/> Box No. VIII Certain observations on the international application

Date of submission of the demand 17.01.2005	Date of completion of this report 22.02.2006
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Moreno, M Telephone No. +31 70 340-4414



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Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
 - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
 - international search (under Rules 12.3 and 23.1(b))
 - publication of the international application (under Rule 12.4)
 - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

Description, Pages

1-11 as originally filed

Claims, Numbers

1-10 as originally filed

Drawings, Sheets

1/5-5/5 as originally filed

a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. The amendments have resulted in the cancellation of:
 - the description, pages
 - the claims, Nos.
 - the drawings, sheets/figs
 - the sequence listing (*specify*):
 - any table(s) related to sequence listing (*specify*):
4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
 - the description, pages
 - the claims, Nos.
 - the drawings, sheets/figs
 - the sequence listing (*specify*):
 - any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-10
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-10
Industrial applicability (IA)	Yes:	Claims	1-10
	No:	Claims	

2. Citations and explanations (Rule 70.7):

see separate sheet

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Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:

D1: US 2003/133424 A1 (CHIN PO SHIN FRANCOIS ET AL) 17 July 2003 (2003-07-17)
D2: WO 01/01595 A (ERICSSON INC) 4 January 2001 (2001-01-04)
D3: EP1 126 627 (NEC CORPORATION) 22 August 2001 (2001-08-22)

2. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1-10 does not involve an inventive step in the sense of Article 33(3) PCT.
 - 2.1. The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses (the references in parentheses applying to this document):

A hybrid rake/equalizer receiver for correlating a delay spread in a spread spectrum system (page 1, paragraphs [0009]-[0010]), wherein a plurality of adaptive equalizers (page 2, paragraph [0019], lines 13-19), each for filtering different regions of the delay spread (page 5, paragraph [0060], lines 16-21; paragraph [0061]). According to these passages the time delays of the B largest or strongest resolved rays are used to determine reference timings for the SEs. Each resolved ray provides a different region of the delay spread) to respectively provide equalized-descrambled chip sequences for correlation (FIG. 5; page 5, paragraph [0068]), and wherein equalizer coefficients respectively corresponding to the plurality of adaptive equalizers are updated individually (page 5, column 1, lines 8-12).

- 2.2. The subject-matter of claim 1 therefore differs from this known hybrid rake/equalizer in that:
 - The different regions of the delay spread are based on a pre-specified energy level

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threshold.

- 2.3. The problem to be solved by the present invention may therefore be regarded as how to allocate rake fingers.
- 2.4. The solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons.

Document D1 is silent about how the path searcher block (number 306 in Fig. 3) looks for the strongest paths in the channel (page 5, paragraph [0060], lines 16-21). However, for CDMA systems, it is well-known that conventional techniques for searching for multi-paths involve a "windowed" search where correlations are made within a specified window of chips of known energy, looking for a correlation that is greater than a specified threshold. This function is performed by a path searcher, i.e. energy peaks in relation to a pre-specified level threshold in the delay spread are identified by the path searcher.

An example of such a path searcher can be seen in document D3, column 4, paragraphs [0022],[0027] and [0028].

- 2.5. Consequently, employing a path searcher that allocates a finger when a region of energy above a pre-specified energy level threshold is found in the delay spread, is well-known in the field of CDMA and does not involve any inventive step.

By using such a well-known path searcher to implement the block 306 of the receiver of D1, the plurality of adaptive equalizer are then allocated to any of the peaks identified by the path searcher that exceed a pre-specified threshold energy level, as claimed in present claim 1.

Thus, the subject-matter of claim 1 does not involve an inventive step.

- 2.6. The same reasoning applies, mutatis mutandis, to the subject-matter of the corresponding independent claim 6, which therefore is also considered not inventive (Article 33(3) PCT).

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3. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of dependent claims 2-5 and 7-10 does not involve an inventive step in the sense of Article 33(3) PCT.
 - 3.1. Dependent claims 5 and 10 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, since the subject-matter of these claims is already present in document D1, page 1, column 1, paragraph 2.
 - 3.2. Dependent claims 2-4 and 7-9 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, the reasons being as follows:
 - The additional feature of summing weighted-correlated outputs to produce a bit estimate of an original non-spread bit stream comes within the scope of the customary practice followed by persons skilled in the art (see for example D2, page 4, lines 4-11).
 - The additional feature of claims 3, 4, 8 and 9, dealing with the weighting factors of the correlation outputs, is merely one of the several straightforward possibilities from which the skilled person would select, without the exercise of inventive skill, especially as the advantages thus achieved can be readily contemplated in advance, in order to appropriately estimate an original non-spread bit stream corresponding to the delay spread.